

New Patent Claims

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1. Method for separating image sequences stored on media such as motion-picture films, video tapes or such like into individual sequences, in which sequence changes of a second type which are based on a change in the image content of successive images are detected and separation markers for the automatic separation of the image sequences into individual sequences are set,
characterized
in that in addition sequence changes of a first type in which the mean brightness of the current image exceeds or falls below a limit value calculated from a moving mean value of the image brightnesses of preceding images are detected, and in that separation markers of a first type are set for sequence changes of the first type and separation markers of a second type are set for sequence changes of the second type.
 2. Method according to Claim 1, **characterized** in that the sequence changes of the first type comprise a predeterminable number of successive individual images of substantially the same brightness.
 3. Method according to Claim 1, **characterized** in that the sequence changes of the second type comprise a predeterminable number of individual images having a substantially corresponding image content.

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4. Method according to Claim 3, **characterized** in that a sequence change of the second type comprises an individual image whose content differs from the contents of preceding images by a predeterminable amount.

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5. Method according to at least one of the preceding claims, **characterized** in that the image sequences are digitized before the determination of sequence changes of the first and second types.

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6. Method according to at least one of the preceding claims, **characterized** in that the image sequences are firstly examined for separation markers of the first type and, in the absence of separation markers of the first type, are examined for separation markers of the second type.

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7. Method according to Claim 6, **characterized** in that a provisional list of all possible separation markers is created, and in that post-processing is effected in order to determine the individual sequences.

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8. Method according to Claim 7, **characterized** in that separation markers of the first type are treated with priority.

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9. Method according to Claim 7 or 8, **characterized** in that separation markers of the second type which are situated within a predetermined distance from separation markers of the first type are discarded.

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10. Method according to at least one of the preceding Claims 7 to 9, **characterized** in that separation markers of the second type are taken into account only if the preceding image sequence contains a predetermined number of individual images.

11. Method according to at least one of the preceding claims, **characterized** in that separation markers which are based on image sequences which fall below a predetermined number of individual images are discarded.

12. Method according to at least one of the preceding claims, **characterized** in that separation markers of the first type comprise a predetermined number of successive black or white images.

13. Method according to at least one of the preceding claims **characterized** in that the images identified as separation markers are themselves not stored, and in that the first image after the separation marker is the first image of the next image sequence.

14. Method according to at least one of the preceding claims, **characterized** in that a moving mean value of the image brightnesses is calculated over a predetermined number of individual images and a lower and an upper peripheral value are determined from the moving mean value and a parameter for the response sensitivity of the separation markers of the first type, and in that a white separation marker is set if the mean value of the current image exceeds the upper threshold

value, and in that a black separation marker is set if the mean value of the current image falls below the lower threshold value.

5 15. Method according to Claim 14, **characterized** in that the mean values of the images identified as separation markers do not enter into the moving average.

10 16. Method according to at least one of the preceding claims, **characterized** in that, in order to find separation markers of the second type between the current and the preceding image, the RMS deviation of the pixel brightnesses is calculated, in that a moving mean value of the RMS deviations is determined over a predeterminable number of preceding image changes and a threshold value is determined from a parameter specifying the response sensitivity for separation markers of the second type, and in that a separation marker is set if the RMS deviation of the current image change exceeds the threshold value.

15 17. Method according to Claim 16, **characterized** in that RMS deviations of separation markers of the second type enter into the moving mean value, but those of separation markers of the first type do not.

20 18. Method according to Claim 7, **characterized** in that in order to determine the individual sequences from the list of all possible separation markers there are discarded all separation marker sequences with separation markers of the first type which are shorter than the number of individual images which is necessary

in order to set a separation marker of the first type, and in

that there are discarded all separation markers of the second type which lie nearer to the remaining separation markers of the first type than the minimum number of images of a sequence which is necessary in order to be terminated by separation markers of the second type.

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19. Method according to at least one of the preceding claims, **characterized** in that a sequence starts with the first image of a file or with the first image after a separation marker of the first type or with a separation marker of the second type and ends with the last image of the file or with the last image before a separation marker of the first type, if it acquires at least the number of individual images which is necessary in order to set a separation marker of the first type, or with the last image before a separation marker of the second type, if it contains at least the minimum number of images of a sequence which is necessary in order to be terminated by separation markers of the second type.

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20. Method according to at least one of the preceding claims, **characterized** in that a selected individual image, preferably the first individual image in each case, of an individual sequence is displayed as an icon on a monitor, and in that the individual sequence is started by clicking on the icon.

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21. Method according to Claim 20, **characterized** in that a sequence of individual sequences is started for viewing by clicking on a plurality of icons.

22. Use of the method according to at least one of the preceding claims for automatically separating digitized films, in particular cardiological films, into individual sequences.

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